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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/388,509	09/02/1999	YASUSHI MARUTA	P/1905-86	4093

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EXAMINER

WILLIAMS, DEMETRIA A

ART UNIT	PAPER NUMBER
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2631

DATE MAILED: 09/17/2003

17

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/388,509

Applicant(s)

MARUTA ET AL.

Examiner

Demetria A. Williams

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 June 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5,7 and 10-13 is/are rejected.
- 7) ☒ Claim(s) 6,8,9 and 14 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 15.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

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DETAILED ACTION

Information Disclosure Statement

1. The information disclosure statement filed June 19, 2003 fails to comply with 37 CFR 1.98(a)(2), which requires a legible copy of each U.S. and foreign patent; each publication or that portion which caused it to be listed; and all other information or that portion which caused it to be listed. It has been placed in the application file, but the information referred to therein has not been considered. This IDS indicates a Japanese Office Action issued on April 9, 2002. However, a copy of this office action was not included with this or any previous IDS so it has not been considered.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

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4. Claims 1, 3, 4, 7, 10, and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Keskitalo et al ("Keskitalo") in view of Kijima et al ("Kijima").

5. Referring to claims 1 and 10, Keskitalo discloses an array antenna reception device comprising multiple antenna array elements (column 5, lines 60-61; figure 4, elements 400-404); a number of RF parts, functioning as the K adaptive receivers of the pending claim (column 5, lines 62-64; figure 4, elements 406-410), which receive signals from the antenna elements, said received signals having a gain in a desired signal direction (column 6, lines 43-46); and a means functioning as the signal synthesizer of the pending claim for weighting and synthesizing the demodulated signals (column 5, lines 66-67; column 6, lines 1-3; figure 4, elements 412-420) and outputting a demodulated signal.

Keskitalo does not specifically disclose the arrangement of the antennas. Kijima discloses several well-known array antenna configurations having a plurality of antenna elements arranged on each side of a polygon (see generally figures 3 and 5; column 1). It would have been obvious to one of ordinary skill in the art at the time of the invention to arrange the antenna elements described by Keskitalo in a polygon arrangement as disclosed by Gordon, as arranging antenna elements in this type of configuration is well known in the art in order to project clearer signals on multiple sides.

6. Regarding claim 2, Kijima further discloses that the directional beam of each side of the polygon is formed outwards from the polygon (see generally column 2, lines 6-11).

7. Referring to claims 3, 4 and 13, Keskitalo discloses that the best signal components of the received signal are searched for in such a way that the detected components can be combined and detected. Keskitalo further discloses that the metric used can be the signal power or the signal to

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noise ratio (column 5, lines 47-54). Thus it would have been obvious to one of ordinary skill in that art at the time of the invention to select components, as taught by Keskitalo, having the maximum signal power or signal-to-noise (or interference) ratio because the stronger the signal, the easier it is to detect.

Regarding claim 7, Keskitalo discloses a despread means for receiving CDMA signals and despreding each signal using a desired spread code (column 7, lines 5-8), arrival direction estimation means for estimating an arrival direction from the output of the despread means (column 7, lines 13-15), antenna weight generation means for generating antenna weights and a weighting synthesizer for forming directional patterns from the antenna weights (column 6, lines 4-18), and a demodulator for estimating a transmission path (column 7, lines 14-35).

8. Claims 5 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Keskitalo and Kijima in view of Asanuma et al ("Asanuma" hereinafter). Keskitalo and Kijima disclose all of the elements as described above in reference to claim 1, but do not disclose the use of maximum ratio synthesis in maximizing the signal to interference ratio. Asanuma discloses a receiver system whereby weighting coefficients are based on signal and interference powers. Asanuma further discloses that when maximum ratio synthesis is performed, a reception signal with a higher desired-undesired signal ratio can be obtained (column 3, lines 50-52). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the teaching of Keskitalo to include the use of maximum ratio synthesis, as done by Asanuma in order to obtain a maximum ratio of signal power (desired) to interference power (undesired).

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9. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Keskitalo and Kijima as applied to claim 10, and further in view of Fukawa. Keskitalo and Kijima disclose all of the elements as described above, but neither makes reference to interference suppression. Fukawa discloses a receiver and array of antennas wherein interference from adjacent signals is adaptively removed. It would have been obvious to one of ordinary skill in the art at the time of the invention to suppress or remove interference due to adjacent signals in order to provide clear, intended signals.

Allowable Subject Matter

10. Claims 6, 8, 9, 11, and 14 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Regarding claims 6 and 14, prior art of record does not disclose the multiplication of a user determination symbol by a transmission path estimation value in order to cancel a phase change caused by phase lock of a carrier wave.

Claims 8 and 9 depend from claim 6 and thus contain the same allowable subject matter.

Regarding claim 11, prior art of record does not disclose the adaptive receivers acting to suppress interference.

Response to Arguments

11. Applicant's arguments with respect to the claims have been considered but are moot in view of the new ground(s) of rejection. Applicant's sole argument was that the prior art previously applied illustrated an array antenna having antenna elements disposed on the vertices

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of a polygon as opposed to on each side of a polygon. The newly cited reference (Kijima) clearly discloses a polygon having array elements on each *side* of a polygon.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Demetria A. Williams whose telephone number is (703) 305-4078. The examiner can normally be reached on Monday - Friday, 8:00 - 4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad Ghayour can be reached on (703) 306-3034. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3800.

daw


MOHAMMAD H. GHAYOUR
PRIMARY EXAMINER